

Francis Bedford

A NEW METHOD

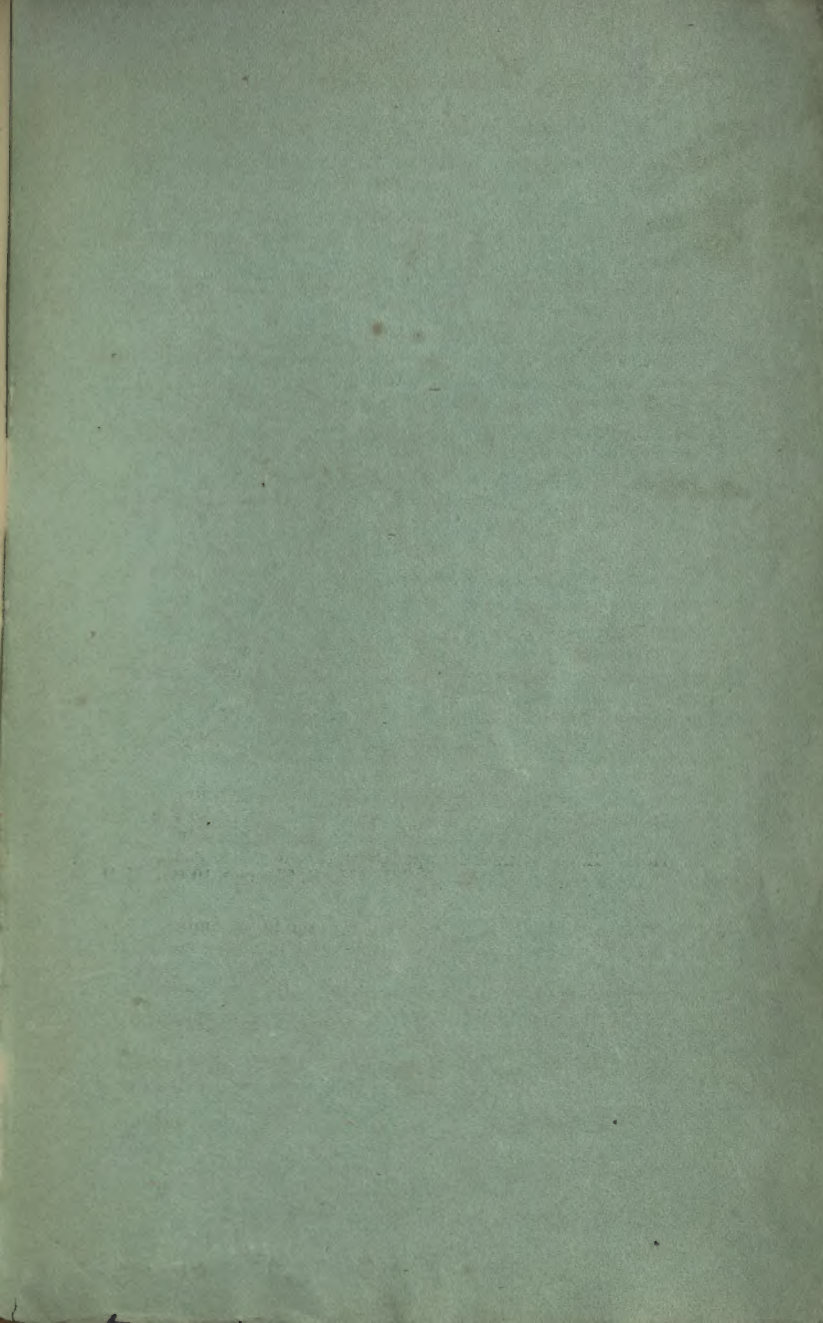
77

OF PRINTING

POSITIVE PHOTOGRAPHS.

BY THOMAS SUTTON, B.A.,
(CAIUS COLLEGE, CAMBRIDGE.)

PRICE, ONE SHILLING.



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A NEW METHOD
OF PRINTING
POSITIVE PHOTOGRAPHS,

BY WHICH
PERMANENT AND ARTISTIC RESULTS MAY BE
UNIFORMLY OBTAINED.

BY THOMAS SUTTON, B.A.,
(CAIUS COLLEGE, CAMBRIDGE.)

TO BE OBTAINED OF THE AUTHOR, BY LETTER, ADDRESSED
ST. BRELADÉ'S BAY, JERSEY.

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C. LE FEUVRE, PRINTER,
BERESFORD STREET, ST. HELIER'S,
JERSEY.

INTRODUCTORY REMARKS.

Two years ago I returned from Italy with some fine negatives of the Antiquities of that country. In printing these I expected to meet with little or no difficulty; for I imagined photographic printing to be a simple and mechanical process, easily learnt and involving no risk or uncertainty whatever. But I soon found out my mistake. Nevertheless, determined to persevere, and succeed at last if possible, and having no other occupation to distract my attention, I devoted myself to this subject; and the result has been, that after a great deal of severe fag, my labours have been rewarded with success. I have discovered a **NEW PRINTING PROCESS** by which printing operations may be conducted with certainty and uniformity. The results being at the same time highly artistic and **PERMANENT**.

This **NEW PROCESS**, which I trust will be found to satisfy the most fastidious criticism, and every reasonable condition, I am about to communicate, in the following pages. And I shall endeavour to do so with the most minute and careful fidelity.

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Nothing is more common than for beginners to underestimate the difficulties of printing. An idea may be formed of what these really are, when a high standard of excellence is desired, when I say, that during the brief intervals of my labours, and as a relaxation from the anxieties and disappointments of the other pursuit, I mastered easily the Daguerreotype and glass negative processes, and also perfected the Calotype on paper.

Should any one be surprised at this, and wonder how I could have stumbled over difficulties which did not seem to occur to others, I would state that I found it easy enough to do as others were doing; but that this did not satisfy me. I could not content myself with results, which were not merely essentially unartistic and vulgar in character, but of questionable permanency. I could not rest satisfied until I had realized a higher standard of excellence, and a certain sentiment and beauty in printing, which should render Calotypes quite equal in effect to proofs on India paper, and at least as permanent as other similar works of human labour.

But the unsatisfactory state in which this branch of Photography appeared to me to be, is now generally admitted; and a Printing Committee has been appointed, under the auspices of His Royal Highness, Prince Albert, in order to investigate the subject thoroughly, and to determine if possible some certain data from which a fresh start might be made. And it is highly gratifying to find that there is sufficient taste and feeling amongst photographers, to render them at last dissatisfied with their present methods. In fact the public have long since recorded their

verdict in the matter, and Calotypes are found to be an unsaleable commodity. That is never the case with any really fine product of industry. The wealthy are always ready to encourage, and want of patronage must be considered in every case, as the certain index of want of merit. Now since no fault can be found with the negatives, or the subjects frequently selected, which have been among the finest in the world, to what are we to attribute this apathy on the part of those who should be purchasers, but to the present vile method of printing. People will not be attracted by repulsive green yellow tints and vulgar albumenized proofs which are found to be, in too many cases, and from the very first day of their publication, under an influence which ends in their destruction. There is more taste in the world than artists of a certain calibre are willing to admit, and people may appear to admire, when in reality it is but the kind of admiration with which a child's first efforts are regarded. Ask of them to become *purchasers*, and their admiration assumes a very different character indeed.

Portraiture, however bad, will always find a certain amount of encouragement, for obvious reasons. But photographic views on paper, can never be remunerative in a pecuniary sense, until really fine subjects are carefully posed, and effectively lighted; the negatives being then delivered over to a printing process, which, while it faithfully records all their details, shall at the same time surpass in effect the best efforts of the copper-plate printer, and be equally permanent.

Even then, it may be doubted, how far photographs, being defective in the skies, and devoid of figures arrested as it were in the very act of motion, may command a sale; but I feel sure that until the old methods of printing shall have been abandoned, the case will remain a hopeless one.

In these remarks, which may be thought severe, I have attempted to arouse attention and to overcome prejudice. I now proceed to the details of a printing process, which appears to me to satisfy all the desired conditions. Viewed as a whole it is entirely NEW. In some concluding remarks I shall endeavour to compare it with the present modes of proceeding, and I hope then to establish its superiority.

I consider myself as addressing the Photographer and not the Tyro. I have already given all the elementary information in a recent treatise on the Calotype process, to which I wish these few pages to be considered as an Appendix.

In conclusion I beg of those, who may be inclined to try this process for themselves, to follow strictly the directions that I have given, and not to deviate from them in the least.

DETAILS OF THE MANIPULATION.

The NEW PROCESS which I am about to describe, involves the following seven operations, viz :—

1. To prepare the paper with serum of milk.
2. To render it sensitive.
3. To expose it in the pressure frame.
4. To develop the picture.
5. To color it with sel d'or.
6. To fix it, and remove by washing the redundant chemicals.
7. To dry, trim and mount the finished picture.

The Photographer who reads this Catalogue, will perceive at a glance that I have abandoned the method of Sun-printing in favor of that by development.

And that in adopting this latter mode of proceeding, I have introduced *two* important novelties, viz. :

In the first operation, I omit altogether the salt, and merely employ a particular organic substance.

And in the fifth operation, I colour my developed picture with gold; by means of a bath, the employment of which precedes, and is independant of the fixing bath.

I was the first to point out, three months ago, in a letter to the Journal of the Photographic Society, this method of colouring sun-prints. It was immediately tried by Messrs. Hardwich and Polluck together, and at the next meeting of the Society, both those gentlemen (who are members of the Printing Committee) spoke favourably of it, and recommended it as a new and useful suggestion.

I have now shown that this simple, and effective method of colouring, (by which I avoid altogether the use of an old hypo-bath) may be applied to positives printed by development.

That mode of printing has hitherto been neglected for an obvious reason. Its results were not presentable, when considered in an artistic point of view; although by careful manipulation they might be kept clean, and rendered faithful copies of the negative. The method was confined to a few photographers, whose moral sense or common sense would not allow them to pursue any plan the permanency of which could be called in question. It has remained for me to show, that positives by development may be coloured with gold, and in this way, not only rendered presentable as works of art, but fortunately *much finer in that very respect* than prints by the ordinary mode. At the sametime that their permanency is indisputable.

But, in applying my gold bath, to a print developed in the ordinary way, as described by Hunt, Bingham, and very re-

cently by Sir Wm. Newton, I could obtain no results of any value. It became necessary therefore to reconsider and modify in many essential particulars, the old methods by development.

This I have done in the first operation by omitting the salt or any similar substance, and substituting for it, serum of milk. It is singular that I find the serum, the *only* organic substance that will answer the purpose. With any other, the operation seems to end in disappointment.

I have thus succeeded in making it all out from first to last. The process seems to be perfect. It leaves nothing to desire : and it is essentially a NEW ONE. I must insist strongly on this, because the title of the advertisement of my former work subjected me to some unfair criticism.

To proceed to the

FIRST OPERATION.

TO PREPARE THE PAPERS WITH SERUM OF MILK.

This is very simple. The papers are to be totally immersed, several together, in a bath containing serum, and left there for a few minutes ; then hung up to dry.

The serum is prepared thus :

Curdle a quantity of fresh milk by means of a piece of rennet. Filter it through a muslin to separate the curd. Then boil it in an earthen pipkin. Filter again through muslin, and afterwards through blotting paper.

I know of no other organic substance, that can safely be substituted for the serum. Its use is *indispensable*. Without it, the prints are likely to become inky and disagreeable in colour.

I do not recommend the use of English papers in this process. The material with which they are sized generally contains fat, and this seems to interfere with the action of the gold bath. Foreign papers sized with starch are the best ; and of these, thin and close grained papers give the most delicate results, and thicker papers the most depth and vigour. Employ for instance the Papier Rive, in the former case, and positive Canson in the latter. Mr. Sanford supplies excellent paper, in great variety, and his advice may be relied upon. See his advertisements in the Photographic Journal.

SECOND OPERATION.

TO RENDER THE PAPER SENSITIVE.

Immerse the papers entirely in a bath of aceto-nitrate of silver, using a bent glass rod to remove air bubbles.

The strength of this bath will vary with the papers employed, and the negative to be printed. When the negative is somewhat feeble, employ a weak solution ; also if delicacy of detail is required rather than depth and vigour. But with a powerful negative depending on vigorous printing for effect, employ a *stronger solution*.

To be more exact, say 15 grains of nitrate of silver to the ounce of water, in the former case, and 30 grains in the latter. Add about the same percentage of glacial acetic acid ; or perhaps rather less. The strength of this acid varies so considerably, that the quantity must always be determined by trial ; but considerable latitude in the proportion seems allowable.

Let the paper remain for two or three minutes in the bath, and then hang it up to dry.

White light must be carefully excluded, for we are conducting a *negative* operation, and not sun-printing.

Sensitive papers may be kept for some days ; but they do not improve by keeping ; and there need be no necessity for putting them to this trial, since the exposure in the pressure frame may be accomplished at any time, fine weather not being necessary, but merely daylight.

Before using the nitrate bath, it should be filtered by passing it through a funnel, having in its neck a tuft of cotton wool.

The strength of this bath is not diminished by use. It can be employed to the last drop without the fresh addition of silver, and it does not become discolored, like that which is employed in sun-printing on albumenized paper. Filtration through animal charcoal is therefore rarely if ever necessary.

THIRD OPERATION.

TO EXPOSE IN THE PRESSURE FRAME.

Make the usual arrangements. Cover the pressure frame with a dark cloth, and convey it to the light. Place it in full sunshine if possible, but that is not absolutely necessary; ordinary daylight will do; it is a question of time. In bad weather when other methods are totally impracticable, this may be employed; for the pressure frame may be placed inside a room, near the window, and even under these adverse circumstances a few minutes of exposure will suffice.

When all is ready, remove the dark cloth and watch carefully the outside border of the positive paper. Experience alone will determine the tint which the border ought to assume, before the exposure should be arrested. This will vary with different negatives, and were I to attempt to fix any definite time as corresponding to certain conditions, I should only mislead. There is no real difficulty in the matter, but experience will be necessary in this, as in all other arts. The time of exposure will range from 20 seconds to as many minutes. But in 20 minutes a print might be obtained, when it would be impossible to print at all by the ordinary method; so that I am supposing an extreme case.

The picture ought to be faintly visible, on removal from the pressure frame.

An *over-exposed* picture, will present, when finished, the same appearance as a sun-print under similar circumstances; that is, it will be too dark. There is no such thing as solarization or reddening, as in the collodion process. The outside border invariably *blackens*. On the other hand an *under-exposed* picture, will be too faint. These distinctions should be borne in mind; as they will determine the time of exposure.

The pressure frame need not be made to open at the back; that is unnecessary.

I may mention here, that when it is thought advisable to shade portions of a negative while the rest is being printed, this can easily be done. Also, masks may be cut, and shaded backgrounds introduced to portraits, very easily, by an experienced hand. In this way, a man who prints with feeling and taste, may introduce clever effects, and improve upon a negative wonderfully.

The exposure in the pressure frame is the only part of this process that is not purely mechanical; and since few negatives are absolutely perfect, it is here, that the man of judgement and taste will be able to prove his superiority.

One of the reasons for omitting the salt in the first preparation, is, that it renders the paper too sensitive and liable to solarize. Without it, the exposure is an operation more under command.

FOURTH OPERATION.

TO DEVELOP THE PICTURE.

As soon as may be convenient after the exposure, immerse the print in a saturated solution of gallic acid.

Should the cuvette have been used before for the same purpose, rinse it with water, then with a solution of cyanide of potassium, (which may be returned to the bottle), and again two or three times with water.

Pour the gallic acid into the bath through a funnel, in the neck of which a piece of cotton wool has been inserted so as to act as a filter.

At the present price of gallic acid, one pint of saturated solution would cost about two pence. A pint would suffice to develop a dozen prints 10 inches by 8 inches.

When the print is first put into the bath, use a bent glass rod to enable you to wet it all over as quickly as possible on both sides. Three or four prints may be developed together in the same bath. In general it will occupy about five minutes.

It will scarcely be necessary to remind the reader a second time of the importance of excluding white light. The same precautions must be observed in this, as in negative processes.

By careful manipulation, the lights of the picture need never become dirty. This is an accident which can only happen through carelessness.

When the picture is sufficiently developed, remove it from the bath and wash it in water, afterwards with a pinch of salt in the water, and then with water again, copiously.

The colour of the shadows will now be a dark reddish brown, but if viewed by transparency they will appear vigorous and opaque. A sun-print held up to the light after similar treatment, would be poor and meagre in comparison. Also, the developed picture will show itself nearly as strongly on the back of the paper as on the face. The back of a sun-print on the contrary being scarcely affected at all. It is evident therefore that the sun-print is less deeply impregnated with the chemicals than the other, although a silver bath of three or four times the strength will have been employed.

I wish here to call particular attention to the circumstance, that a developed print loses nothing by the subsequent action of the coloring and fixing baths; for *all* that may have been gained in the gallic acid will be found in the finished picture. The process of development advances gradually up to a certain point, and is then stopt; nothing being afterwards sacrificed.

In sun-printing, on the contrary, the operation has first to be conducted to a considerable extent *beyond* the desired point, and then the *over-exposed* print has to be reduced in a bath, which, while it colours, also dissolves out the lights, and buries their delicate details in a mass of yellow deposit!

FIFTH OPERATION.

TO COLOUR THE PRINT WITH SEL D'OR.

This is a very simple process indeed. It may be effected in a sort of half light, near a door which is ajar, or a north window with the blind partly drawn. For it will be remembered, that there being little or no chloride in the print, it is now nearly fixed.

The bath is made by dissolving 15 grains of sel d'or in one quart of distilled water.

I have now given up the addition of muriatic acid to this bath, which I had recommended on a former occasion. It is therefore perfectly safe.

Pour as much of the solution into the bath as you require for one print.

Immerse the print completely, and keep it moving about, while you watch the changes of colour that it undergoes. In the course of a very few minutes it will be seen to pass through every intermediate shade from a brown to a violet black.

Stop the process at whatever tint you may think the most agreeable.

But above all things, observe carefully the changes which may be taking place in the *lights*, and do not let these go beyond a certain point.

One of the great charms of this mode of colouring is, the exquisite tint that it imparts to the *LIGHTS*. Any one who has once fully appreciated this, will look with great distaste upon the abominable green yellow tints which the old hypo-baths impart to the paper.

There is no necessity to employ the colouring bath, immediately after development. On the contrary, a great many developed prints may be left together in a pan of water, and coloured on the following day, or whenever it may be found convenient.

Do not omit to wash the print after development, in the way that I have described; for if this is neglected, it will occasion a considerable precipitation of the gold in the coloring bath.

When you have removed the print, return the gold bath to the bottle; it may be used again and again, until it gets too weak for further service.

Mr. Hardwich stated as the result of his analysis of a whole sheet of paper which he had blackened by my method, that it contained only the one twentieth part of a grain of gold. This will shew how small a quantity of the precious metal is required to produce strongly marked results.

I believe that no more gold is necessary when employed in the manner that I recommend, than would be required, if added to an old hypo-bath, in the usual way. And I may observe also, that the addition of gold to old hypo-baths, appears to me to increase the permanency of prints coloured in *that* way. Although I must not be considered as recommending that method, in making this remark.

SIXTH AND SEVENTH OPERATIONS.

TO FIX AND FINISH THE PRINT.

Fix in a fresh hypo-bath of half the usual strength; that is, containing one part of hypo to ten of water.

Wash, trim, and mount in the usual way.

CONCLUDING REMARKS.

It now remains for me to compare my new process, with sun-printing ; and to point out its superiority in many respects.

First—IN PERMANENCY.

The permanency of photographs, whether negative or positive, that have been produced by gallic acid, has been already *proved*, if the experience of fifteen years or more, can be said to prove anything in photography. But if works already permanent could be supposed to be rendered more so by any treatment, then their coloration by gold in the way that I have described would assuredly have that effect.

On the contrary, the want of permanency of sun-prints, coloured in old hypo-baths is so notorious, that a Printing Committee has been appointed to investigate the subject.

Secondly—IN ARTISTIC EFFECT.

I have already strongly expressed my opinion on this point. Prints by my method resemble proofs on India paper so exactly that it is scarcely possible to say whether they are

calotypes or not; at the same time they faithfully record all the details of the negative. If that is not enough, to satisfy criticism, then let the Engraver himself despair, and follow some other occupation.

I have already said what I think of sun-prints coloured in old baths. They possess no richness and vigour, unless they are bedaubed with albumen, and in that state they can be compared to nothing that has yet been considered beautiful. Their appearance is as original as it is vulgar; and the public regard them with indifference, or merely as matters of curiosity.

In sun-printing, the picture is entirely superficial. A darkened surface of chloride protects the sensitive matter beneath from the action of light, and this, which has merely served as a support to the other, is afterwards washed out in the baths, and generally goes down the sink. M. Davanne has shown that 95 per cent of silver is lost in this way.

There is therefore no depth or vigour in sun-printing on plain paper; the proofs are dead and require a varnish.

By my method, on the contrary, *the entire substance of the paper is dyed through and through with the chemicals*, and the picture is nearly as strongly marked on the back as on the face. A varnish is therefore as unnecessary as it is undesirable. My proofs are as rich and vigorous as if they had been struck off in printer's ink.

Thirdly—IN ECONOMY.

In sun-printing the silver bath is three or four times as strong as that which I require. The gold employed is about the same ; and the fixing and toning baths consume considerably more hypo. On the other hand, the gallic acid in my process costs something. In a print 9 inches by 7 inches it costs about half a farthing.

It appears therefore that a gallic acid print colored by gold, can be produced at less than half the price of a sun-print colored in an old hypo-bath also containing gold.

Fourthly—IN UNIFORMITY OF RESULT.

None of my baths alter in *constitution* by use. The silver bath remains of the same strength to the last drop. The gold bath merely *gets weaker* by use. Their chemical constitution undergoes no change. The difficulties of my method are therefore purely *mechanical* and not *chemical*. So that in the hands of a skilful operator uniformity of result is absolute, and inevitable.

But that is not the case in sun-printing. The silver bath not only gets weaker by use but grievously discoloured by the albumen ; while the hypo-coloring bath alters materially in its chemical composition with every fresh proof that is put

into it. Its action is therefore highly complicated and uncertain. It also happens, as might have been expected, that sun-printing being entirely superficial in character, there is considerable irregularity in the state in which prints leave the pressure frame.

Putting these facts together, it need be no matter of surprise that sun-printing should be uncertain and unequal in its results.

I may therefore affirm without fear of contradiction, that the method which I have described in these pages, possesses advantages over that in general use, in the following particulars, viz: Permanency, Artistic Effect, Economy, and Uniformity. Add to this, that it can be conducted at any season and in any climate; and that the entire series of operations, commencing with the exposure to light, can be completed in general in ten minutes, and there seems but little left to desire.

The accomplished photographer will find the manipulation of the process perfectly easy and elegant.

To the beginner it may be recommended as forming a very proper introduction to the science. Let him not think of the Camera until he shall have first mastered these details in their application to the reproduction of engravings, by the method of superposition.

To start in the science of photography with Collodion portraiture and sun-printing, as so many do, is entirely unreasonable, and rarely successful. For portraiture is the most difficult branch of the art, and sun-printing the least satisfactory of all its processes.

I now conclude these remarks in the sincere hope that what I have said may not prove to be entirely without weight with my brother photographers; and in the firm belief, that a fair trial will justify every word of commendation that I may have bestowed on the process under discussion.

If I have on two or three occasions expressed my opinion somewhat strongly, in depreciation of present methods, I have spoken, as I felt, and I am certain that there are many who will at once echo that opinion.

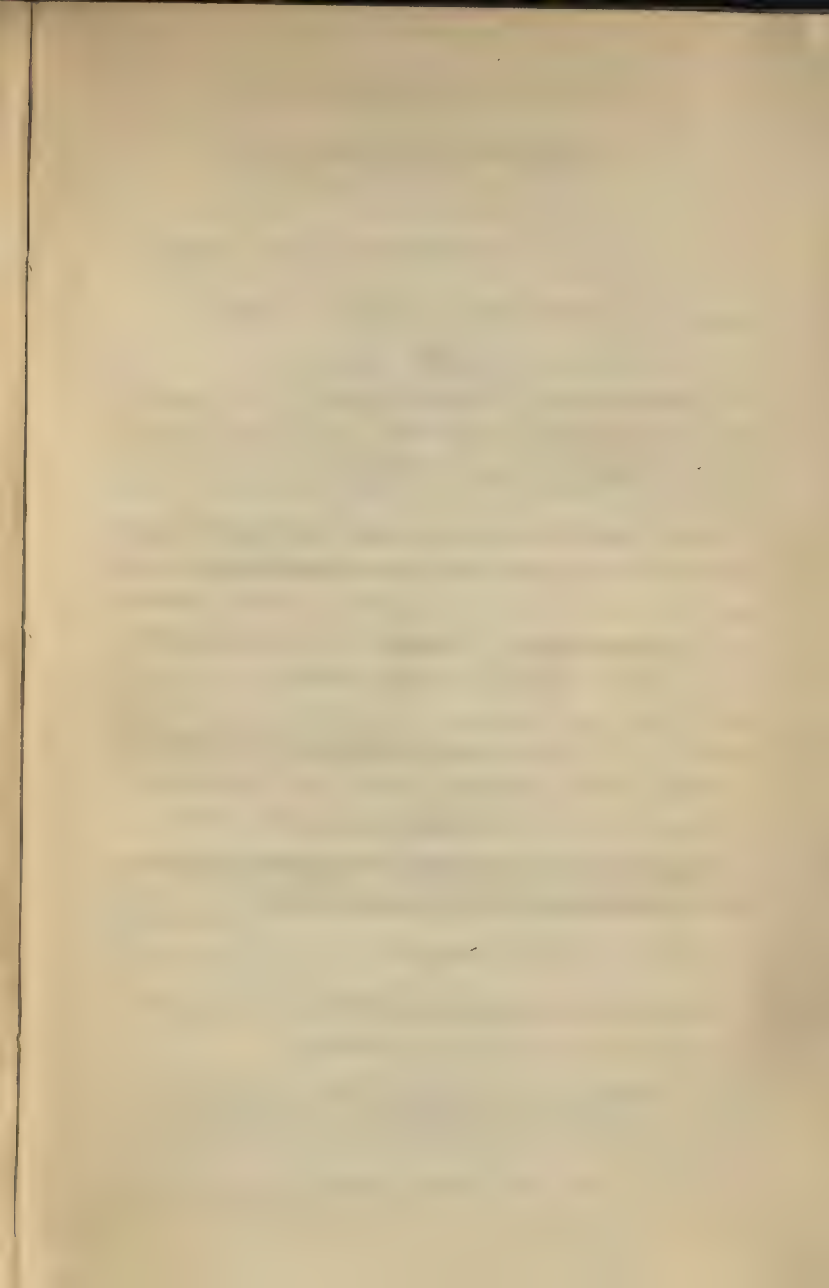
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Considering myself at last, in possession of a very effective and satisfactory printing process, I am naturally anxious to turn it to some useful and profitable account.

It has occurred to me that a legitimate and beautiful application of Photography would be, the reproduction by its means, of works of art; such as paintings, sketches, models, &c., by eminent artists. One great merit of photographic copies of such works; would be their accuracy; for they frequently lose much in passing through the hands of the Engraver. In sketches, more particularly, the happy touches of the brush would be faithfully rendered; and in this respect, Photographic Prints would possess considerable interest.

I shall be happy to correspond with gentlemen possessing works of the character to which I have alluded.

Communications addressed to the Author, will be promptly acknowledged.





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